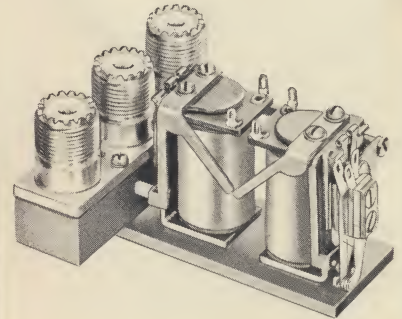
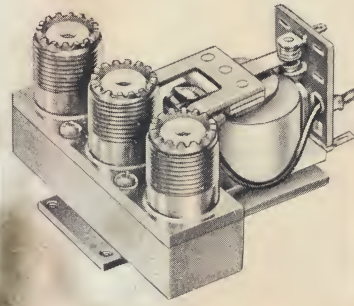
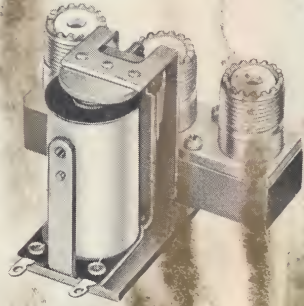
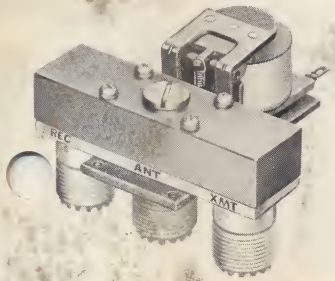
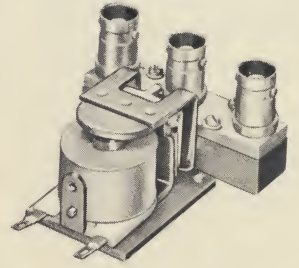
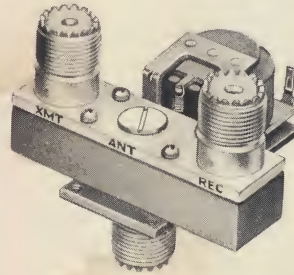
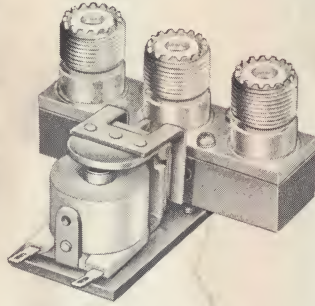
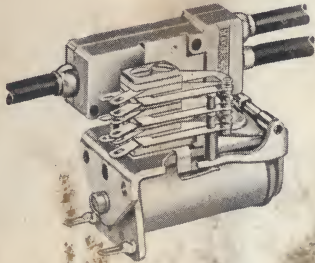
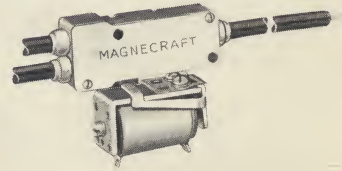
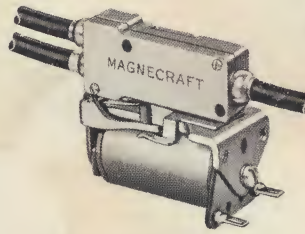
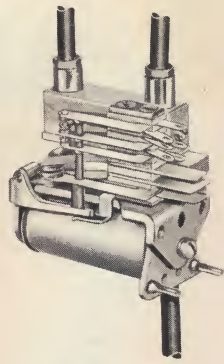
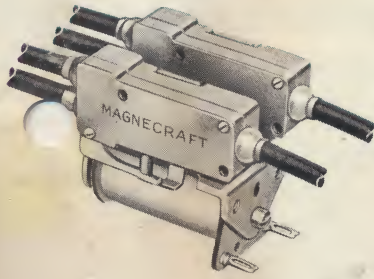




HIGH RELIABILITY MAGNECRAFT COAXIAL RELAYS

High Reliability Coaxial Relays of Great Versatility

MAGNECRAFT Coaxial Relays have been developed especially to meet today's exacting demands for reliable radio frequency switching through coaxial cables and connectors in minimum size at low cost.

Basically, these Relays are not new. Each type comprises a proven relay structure that MAGNECRAFT has made for many years integrated with a first quality Coaxial Switching Cavity.

This practical method of design brings to RF Switching proven operating reliability plus the great versatility provided by the extensive line of MAGNECRAFT Relay Structures.

For example, in this bulletin you will find Coaxial Relay Types designed for minimum size and weight; types for AC or DC operation; types with Time Delay; types with auxiliary contacts and types with mechanical latching which hold the RF Switch without coil power in either position until the opposite coil is energized.

Actually, the variations shown in this bulletin merely suggest the almost endless variations you can obtain from MAGNECRAFT. Should you fail to locate the combinations you need just tell us your requirements.

FEATURES

1. Low VSWR through radio frequencies
2. Excellent cross talk characteristics
3. Wide selection of connectors
4. Fast operation
5. Long life—one million cycles, minimum
6. Low wattage operating coils
7. Optional Auxiliary Contacts and Mechanical Latching.
8. High reliability in small size at low cost

ORDER INFORMATION

Magnecraft engineers are glad to co-operate in selecting, adapting or engineering relays to meet your application requirements. For this purpose, the following information is required.

1. Basic relay type
2. Coaxial contact combination, contact load and frequency
3. Auxiliary contact combinations (if required) and contact load
4. Operating coil voltage or current
5. Type of connectors
6. Type of cables and lengths
7. Other Features

COAXIAL RELAY CHARACTERISTICS AND DEFINITIONS

1. COAXIAL RELAY—WHAT IS IT?

A relay, with coaxially oriented switching arrangement enclosed in a metal cavity that provides desired characteristic of impedance and electrical shielding, for switching radio frequency current with minimum loss introduced by the relay (when its characteristic impedance is equal to that of the line).

2. VOLTAGE STANDING WAVE RATIO (VSWR)

The power loss due to mismatch introduced into the line by a relay expressed as a ratio of the highest voltage to the lowest voltage found in the RF line. **NOTE:** In RF transmission lines it is desirable to avoid, wherever possible, standing waves which create reflected power losses.

3. INSERTION LOSS

The attenuation, measured in db, produced by insertion of closed relay contacts into a closed signal circuit.

4. ATTENUATION

The reduction in strength of an electrical impulse or signal.

5. CROSS TALK

The coupling between a closed contact circuit, or other open or closed contacts, on the same relay switch, expressed in db down from the signal level in the closed circuit.

6. GROUNDING CONTACTS

With the coaxial relay in the de-energized position, the normally open contact blade is grounded against the inside wall of the cavity body, thereby grounding the transmitter. In the energized position the contact blade is grounded against the opposite wall, thereby grounding the receiver. **NOTE:** Grounding contacts reduce RF leakage to the disengaged connector and is recommended where optimum circuit isolation is required. It is generally possible that grounding reduces cross talk approximately 20db down from comparable non-grounded or resistor terminated contacts.

7. NON-GROUNDING CONTACTS

In non-grounding coaxial relays the disengaged contact blade does not ground against the cavity wall. **NOTE:** With non-grounding coaxial relays "resistor terminated" circuits are used to ground the disengaged connector through a resistor.

MAGNECRAFT Class

The New Magnecraft Class 128 Coaxial Relays provide, in small, compact size, RF Switching up to 500 watts maximum to 4000 megacycles combined with the High Reliability and Long Life users have learned to expect from MAGNECRAFT Relays.

FEATURES

A unique pin type armature hinge of heavy duty design and precision construction, assures stabilized adjustment through millions of operations.

The heavy duty Coaxial cavity is equipped with three Coaxial connectors of matched impedance; one common (antenna), one normally closed (receiver), and one normally open (transmitter).

Coaxial switch is impedance matched to 50 ohm cable; loss is negligible with 75 ohm cable.

COIL DATA

1. Standard operating voltages are listed in Table C. Available for intermediate and higher operating voltages up to 110VDC and 115VAC.
2. D.C. Power Requirements—2 watts nominal.
3. A.C. Nom. Power Requirements, 3va.
4. Insulation to ground tested at 750 VAC RMS as standard.

COAXIAL SWITCH

1. Contact Combination: SPDT impedance matched to a 50 ohm cable.
2. Contacts: for RF switching, Silver Cadmium Oxide, Gold Flashed. Capable of switching up to 500 watts (depending on connectors) to 4000 megacycles.
3. Initial Contact Resistance: .05 ohms nominal.
4. VSWR (Voltage Standing Wave Ratio): 1.25:1 maximum from 0 to 470 megacycles.
5. Crosstalk: 40 DB min. from 0 to 470 megacycles.
6. Dielectric Strength: 1,000 volts AC RMS at sea level.
7. Insulation Resistance: 1,000 megohms min.
8. Operate Time: 20 milliseconds Max at nominal coil voltage available when specified.
9. Release Time: 20 milliseconds Max at nominal coil voltage at 25°C when specified.

MECHANICAL SPECIFICATIONS

1. Coaxial Cavity: Contact structure is enclosed in a heavy duty, precision machined, brass cavity with removable plug for convenient inspection of contacts.
2. Coaxial Connectors, Type UHF is standard—Type N or type C furnished when specified.

AMBIENT TEMPERATURE

—55°C to +65°C standard. Insulation and coils for higher temperature furnished when specified.

VIBRATION

10-55 CPS @ 10 Gs acceleration (suitable for mobile service)

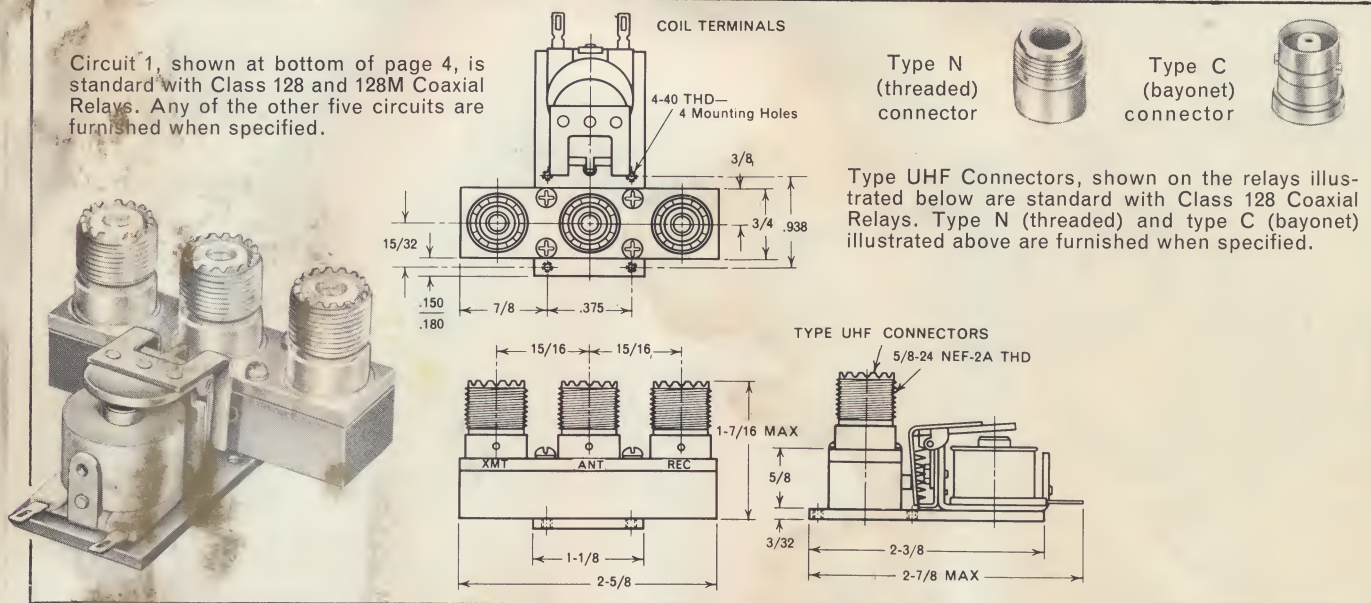
SHOCK

30 Gs for 11 milliseconds (sand drop)

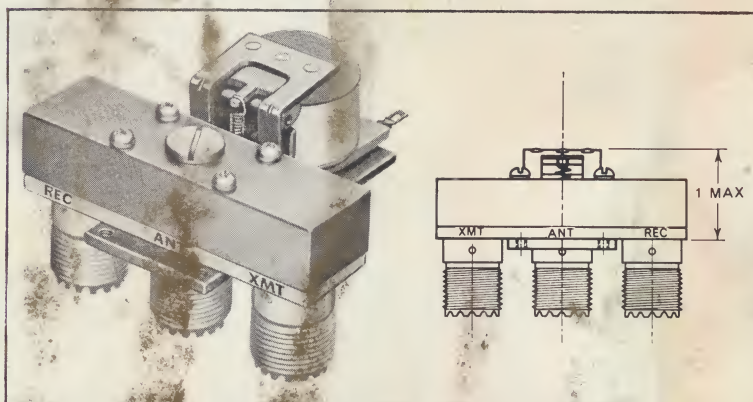
ss 128 and 128M Coaxial Relays for High Power Rad

MAGNECRAFT Class 128 Coaxial Relays—Type I, Flat Mounting

Circuit 1, shown at bottom of page 4, is standard with Class 128 and 128M Coaxial Relays. Any of the other five circuits are furnished when specified.



Class 128—Type II, Bulkhead Mounting



Class 128—Type III, Thru Panel Mounting

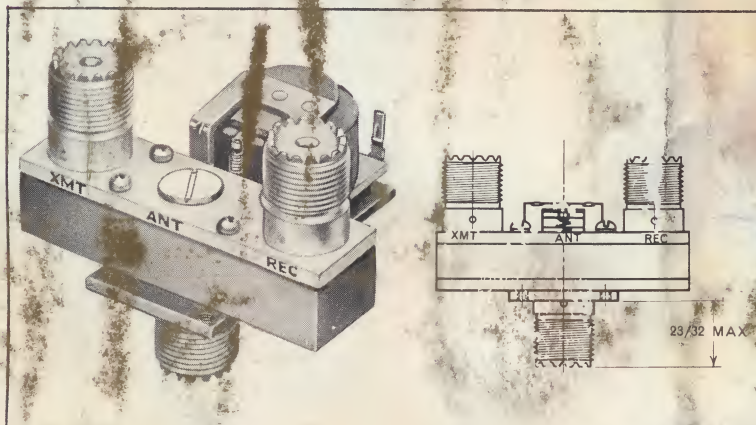


Table C—Class 128 Coaxial Relays

SPDT, RF Switching Contacts—Type I, Flat Mounting

Catalog Number	Operate Voltage	Coil Res. Ohms*	Circuit	Connector Type	RF Switch Capacity
128X-5	6VDC	25	(1) grounding	UHF	100W
128X-8	6VDC	25	(2) non-grndg	UHF	100W
128X-6	12VDC	100	(1) grounding	UHF	100W
†W128X-9	12VDC	100	(2) non-grndg	UHF	100W
128X-7	24VDC	400	(1) grounding	UHF	100W
†W128X-10	24VDC	400	(2) non-grndg	UHF	100W
128AX-6	115VAC	nom. p. 3va	(1) grounding	UHF	100W
†W128AX-7	115VAC	nom. p. 3va	(2) non-grndg	UHF	100W
128X-12	24VDC	400	(1) grounding	N	500W
128X-13	24VDC	400	(2) non-grndg	N	500W
128AX-9	115VAC	nom. p. 3va	(1) grounding	N	500W
128AX-10	115VAC	nom. p. 3va	(2) non-grndg	N	500W

With DPDT (2 Form C) Auxiliary Contacts

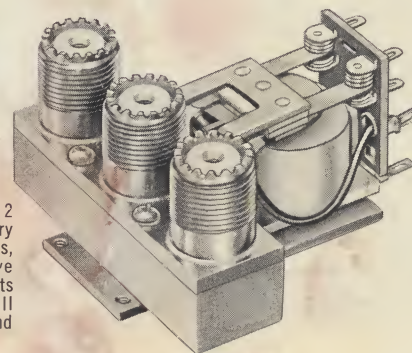
†W128AX-11	115VAC	nom. p. 3va	(2) non-grndg	UHF	100W
†W128X-14	12VDC	100	(2) non-grndg	UHF	100W
†W128X-15	24VDC	400	(2) non-grndg	UHF	100W

†Prefix W indicates model in stock for immediate shipment.

*Plus or minus 10%, $\pm 25^\circ\text{C}$

†Voltage operated relays pull in at 83% of nominal voltage

Class 128 relay with 2 Form C (DPDT) auxiliary contacts, rated 10 amps, 115VAC, non-inductive load. Auxiliary contacts are available with all models of Class 128 and Class 128M Relays.



MAGNECRAFT Class 128M Coaxial Relays—Type I, Flat Mounting

Class 128M is similar to Class 128 except the Coaxial Switch Cavity is smaller. Type BNC (bayonet) connectors, shown on relays illustrated below, are standard for 128M Relays; type TNC (threaded) connectors shown at right are furnished when specified.

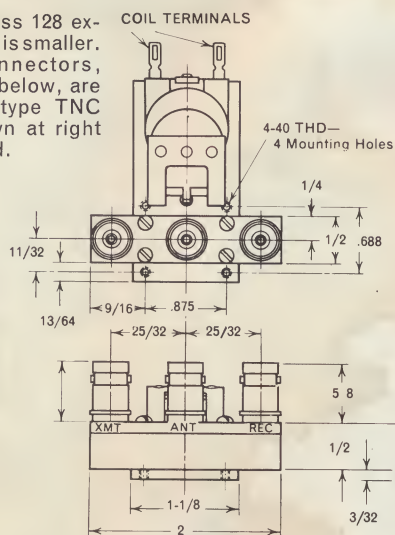


Table D—Class 128M Coaxial Relays
SPDT, RF Switching Contacts—Type I, Flat Mounting

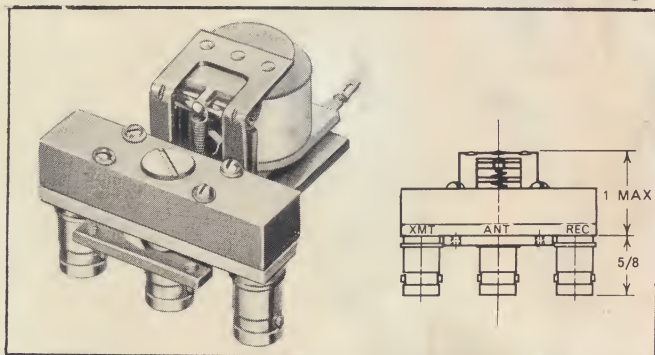
Catalog Number	Operate Voltage	Coil Res. Ohms*	Circuit	Connector Type	RF Switch Capacity
128MX-1	6VDC	25	(1) grounding	BNC	100W
128MX-2	6VDC	25	(2) non-grndg	BNC	100W
128MX-3	12VDC	100	(1) grounding	BNC	100W
128MX-4	12VDC	100	(2) non-grndg	BNC	100W
128MX-5	24VDC	400	(1) grounding	BNC	300W
128MX-6	24VDC	400	(2) non-grndg	BNC	100W
128AMX-1	115VAC	nom. p. 3va	(1) grounding	BNC	100W
128AMX-2	115VAC	nom. p. 3va	(2) non-grndg	BNC	100W

*Plus or minus 10% at +25°C

†Voltage operated relays pull in at 85% of nominal voltage

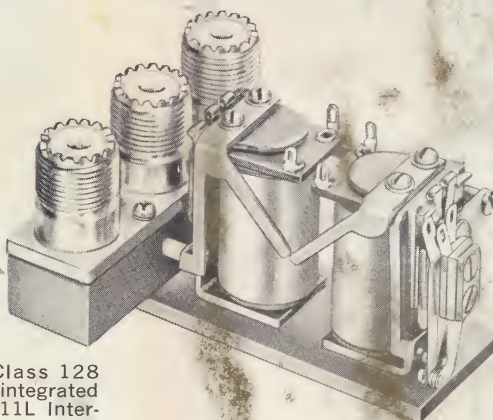
Type TNC
(threaded)
connector

Class 128M—Type II, Bulkhead Mounting

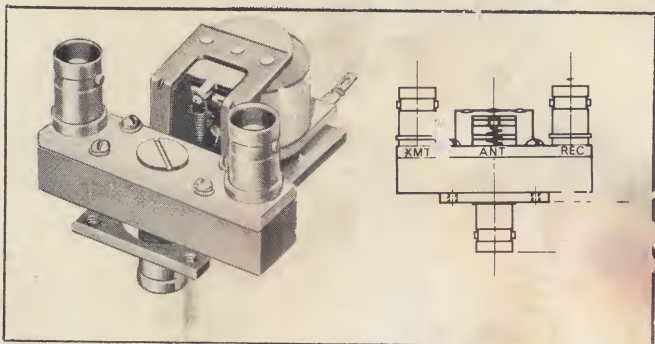


Class 121L Latching Coaxial Relay

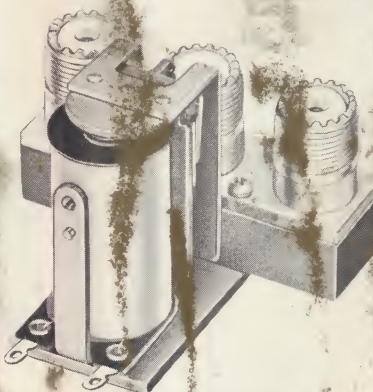
Includes the Class 128 Coaxial Switch integrated with the Class 11L Interlocking Relay. Each armature latches when pulled-in, which holds the switch in either position without coil power until the other coil is energized. Unit illustrated has Form C (SPDT) auxiliary contacts.



Class 128M—Type III, Thru Panel Mounting



Class 127 Coaxial Relay—developed for applications requiring great sensitivity. Comprise Class 128 Coaxial Switch with Class 87 Relay Structure.



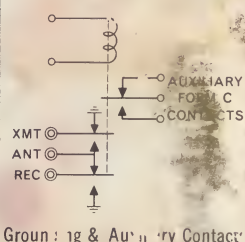
Circuit 1



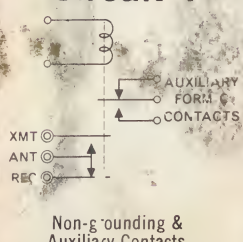
Circuit 2



Circuit 3



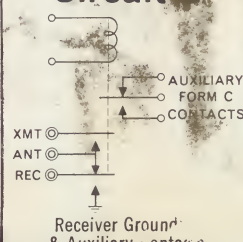
Circuit 4



Circuit 5



Circuit 6



MAGNECRAFT Class 120 and Class 122

Magnecraft Coaxial Relays have been developed especially to meet today's exacting demands for reliable Ultra High Frequency Switching through Coaxial Cable in small size and at low cost.

The gold plated, heavy silver cadmium oxide contacts are supported directly from the cable connectors for extremely low loss at very high frequencies.

The entire single pole, double throw contact structure is housed in a heavy duty die cast enclosure. A removable side plate provides for ready inspection of internal contacts.

ELECTRICAL SPECIFICATIONS

1. Contact Combination—Single Pole, Double Throw
2. Contact Rating—for antenna transfer—150 watts RF maximum up to 470 megacycles
3. Initial Contact Resistance—.05 ohms maximum
4. VSWR (voltage standing wave ratio)—1.25/1 maximum from 0 to 470 megacycles
5. Cross Talk—40 DB minimum from 0 to 470 megacycles
6. Dielectric Strength—1000 volts RMS at sea level
7. Insulation Resistance—1000 megohms minimum
8. Operate Time—15 milliseconds maximum at nominal coil voltage available when specified
9. Release Time—7 milliseconds maximum at nominal coil voltage at 25°C when specified
10. Ambient Temperature —55°C. to +65°C. Insulation and coils for higher temperature rating furnished when specified

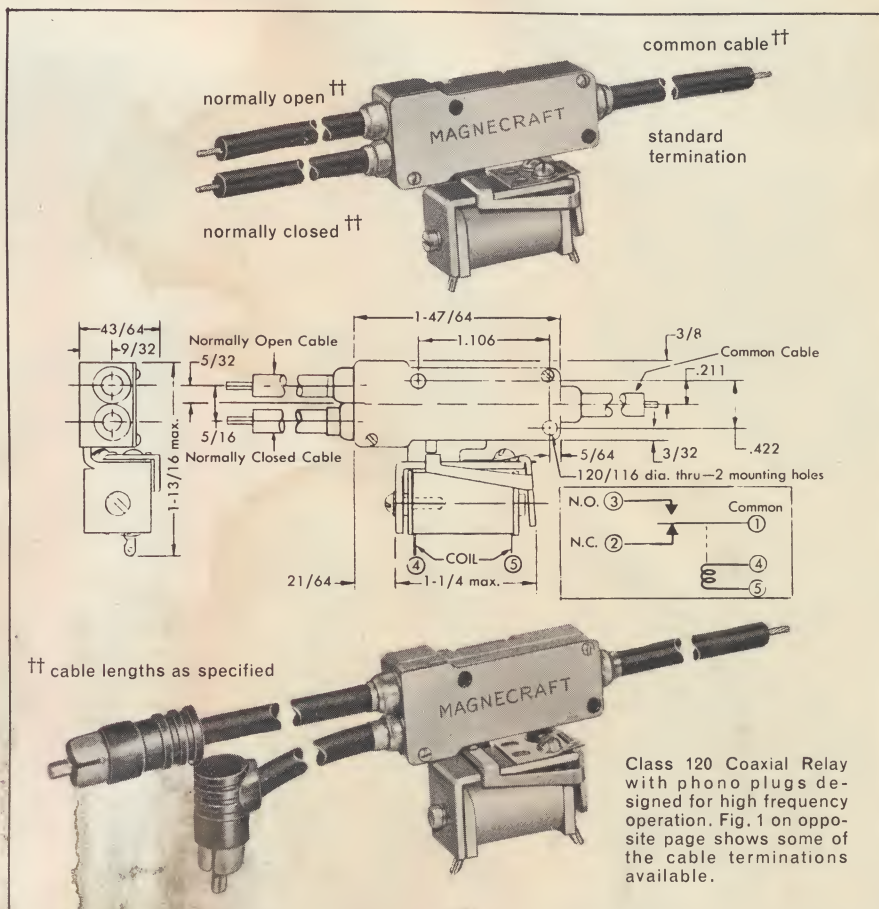
MECHANICAL SPECIFICATION

1. Enclosure—Contact structure is enclosed in heavy duty die cast housing with removable side plate for convenient inspection of contacts.
2. Terminals—Coaxial cable terminations with inner and outer conductors stripped $\frac{1}{8}$ inch are standard. Terminations with coaxial connectors can be furnished when specified.
3. Coaxial Cable—50 ohms standard. Cables are permanently secured to the cavity housing and cable lengths must be specified.

RG58A/U is standard. Other coaxial cables can be supplied provided the outside diameter does not exceed RG58/U and the inner conductor will pass through a .032 diameter hole.

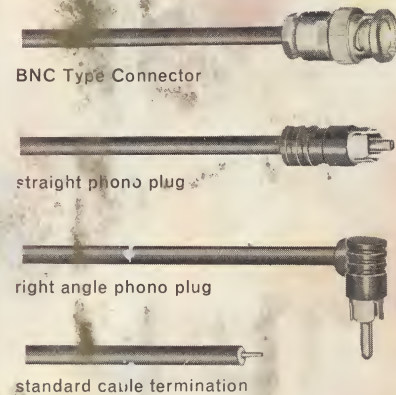
Figure 1. Some of the Cable Terminations available with MAGNECRAFT Coaxial Relays.

Class 120 Coaxial Relays for Minimum Space and Weight



Magnecraft Class 120 and Class 122 Coaxial Relays are furnished with cables factory installed in the switch housing for proper impedance matching. Cables can be equipped with a wide selection of connectors on special order.

Figure 1. Some of the Cable Terminations available with MAGNECRAFT Coaxial Relays.



A Class 120 Coaxial Relay consists of the MAGNECRAFT standard Coaxial cavity integrally assembled to a Class 33 Relay basic structure. The Class 120 is ideally suited for applications where space and weight must be kept to a minimum.

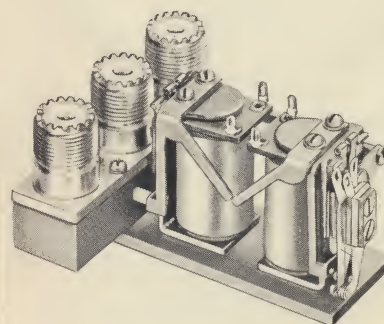
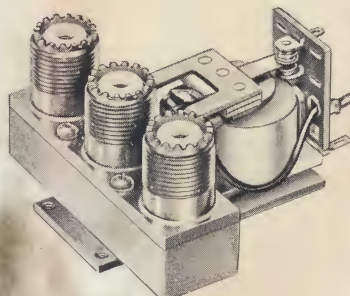
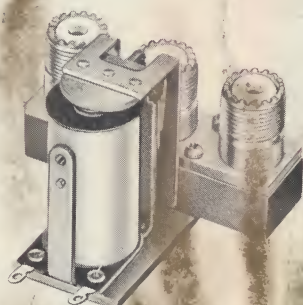
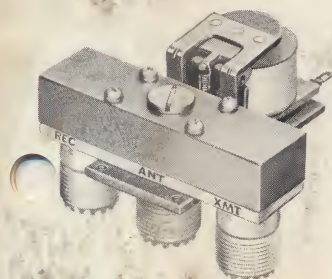
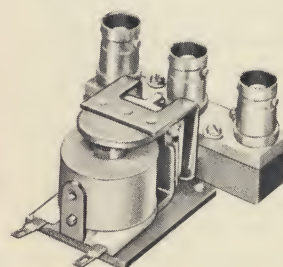
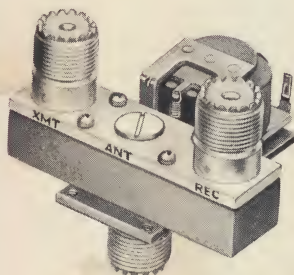
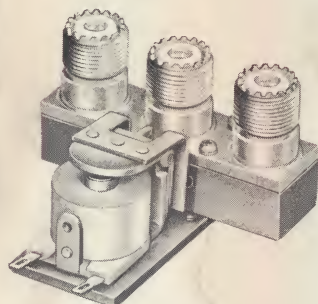
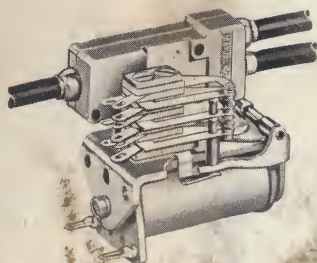
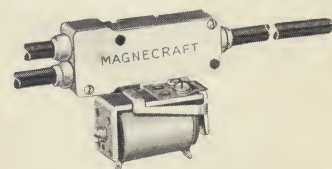
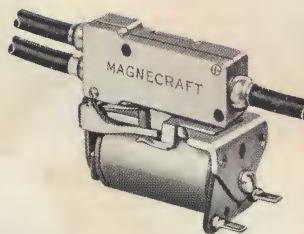
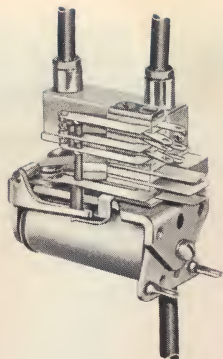
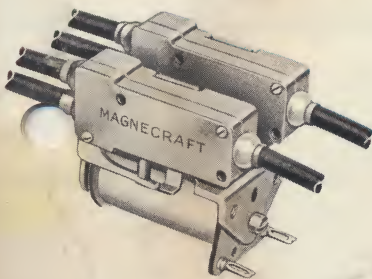
Table A—Class 120 Standard Coaxial Relays

Catalog Number	†Nom. VDC	Nom. MADC	*Resis. Ohms	Cables—RG58A/U		
				Com'n.	NC	NO
120X-13	6	215	28	12" long std. term.	12" long std. term.	12" long std. term.
120X-14	12	120	100			
120X-15	24	48	500			
120X-16	48	27	1800			
120X-17	110	17	6500			

*Plus or minus 10% at +25°C

†Voltage operated relays pull in at 85% of nominal voltage

Please note all cables on above standard relays are 12 inches long with standard cable terminations. In ordering by above Catalog Numbers any deviation required from these standards must be specified.



HIGH RELIABILITY MAGNECRAFT COAXIAL RELAYS